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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PICKARD, ALISON K

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,433	Applicant(s) FISCHER ET AL.	
	Examiner Alison K. Pickard	Art Unit 3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 26 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 26, "said masking cover" lacks antecedent basis.

Claim 33 is unclear. Claim 26 is a product claim and therefore the portion of the claim talking about subsequent removal of the coating is considered intended use. The piston ring only needs to be capable of producing the sharp edge (in other words the claim can't be both a produce and process claim at the same time). So, claim 33 is improper because it now appears to be positively claiming the sharp-edge. It appears this issue would be cleared up if the claim were to state something along the lines that the edge is capable of being provided between the contact surface and lower side.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 21-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant

Art Unit: 3676

art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Reasons provided below.

5. Claims 21-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As stated above, claim 21 is confusing because it appears to be claiming a product claim as well as product steps. For purposes of examination, the claim is interpreted as a product claim wherein the piston ring only needs to be capable of yielding the sharp edge if the coating is removed.

Claim 22, there does not appear to be an embodiment disclosed having both a "land" projecting from the coating AND a masking cover formed separately. And, only Figure 3a shows a land projecting past the coating as required by claim 21 so there does not appear to be disclosure or enablement for claims 25 or 26. Also, if the masking cover is something different than the land, there does not appear to be support for claim 25, which requires the masking to be formed from the base, but still be a separately formed element.

Claim 34 requires the VD coating to be applied to the contact surface. However, how is this possible if a cover is on the contact surface?

The claims have been examined as best understood.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3676

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 21-23, 25-27, 30-35, 37, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer in view of Anderson (2,905,512) in view of Ishida (5,316,321).

Beyer discloses a piston ring and method comprising a base 1 with a contact surface 3 and upper and lower side surfaces. The contact surface is provided with a coating 2. A portion of the surface is supplied with a removable cover (portion above line 12, which is removed). Once removed, a sharp edge is formed between the side and contact surface (col. 4, lines 37-38). The contact surface profile has a cross member 5. The profile is partly conical and includes a groove/undercut (near 9). Beyer does not appear to disclose that the removable cover is applied outside the contact surface or is a strip/band or that the coating is unaffected. Anderson teaches an alternate method of applying a coating to only desired locations of a piston ring. Anderson teaches that the piston ring sliding surface is first ground (see col. 3, lines 19-26). Then a maskant 36 is applied to locations where a coating should not be applied (such as at portions 5 of Beyer). The maskant is removed after the ring has been coated. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method taught by Anderson as such is known technique that would yield expected results. Prior to removal of the maskant, the "land" area (including the maskant) would project past the coating in the recess as required by claim 21.

Beyer also does not disclose the coating is Cr or N based and applied by vapor deposition (i.e. PVD or CVD). Ishida teaches a method of coating a piston ring. Ishida teaches that thermal spraying (of Mo, etc) is equivalent to PVD of a Cr or N based coating (see col. 5, lines 56-68).

Art Unit: 3676

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an equivalent technique such as PVD of a Cr or N based coating to protect the piston ring.

Regarding claims 27 and 37, neither Beyer nor Ishida appear to disclose the claimed coating thickness. However, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the coating in the claimed thickness range.

8. Claims 28, 29, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer in view of Anderson in view of Ishida as applied to claims 21 and 34 above, and further in view of Iwashita.

Beyer does not appear to disclose a chrome layer on the sides of the ring. Iwashita teaches a piston ring with coatings. Iwashita teaches using a chrome layer 5 to alleviate strain. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a chrome coating on the piston ring of Beyer to improve the strength.

9. Claims 21-27, 31-35, 37, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takao (3,944,236) in view of Anderson in view of Ishida.

Takao discloses a method and piston ring with a base 1 having a contact surface 5 with a cross member portion 1'. A portion of the contact surface has a chrome coating⁴ in a groove. The surface also has undercuts 7 for an oil reservoir. Takao does not appear to disclose the chrome coating is CrN, that it is applied with vapor deposition, or the removable cover required by the claims. Anderson teaches a method of coating a piston ring. Anderson teaches that the

Art Unit: 3676

piston ring sliding surface is first ground (see col. 3, lines 19-26). Then a maskant 36 is applied to locations where a coating should not be applied (such as at portions 1' of Takao). The maskant is removed after the ring has been coated. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method taught by Anderson as such is known technique that would yield expected results. Prior to removal of the maskant, the "land" area (including the maskant) would project past the coating in the recess as required by claim 21.

Ishida teaches a method of coating a piston ring. Ishida teaches vapor deposition is a known and effective method of applying a chrome coating and that CrN is a known and suitable chrome coating for piston rings. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use CrN as the chrome coating and to apply it using PVD since the use of a known element and technique to improve a similar device yields expected results.

Regarding claims 27 and 37, neither Takao nor Ishida appear to disclose the claimed coating thickness. However, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the coating in the claimed thickness range.

Response to Arguments

10. Applicant's arguments filed 10-12-09 have been fully considered but they are not persuasive.

Art Unit: 3676

The rejections have been maintained for the new claims. As set forth above, the method taught by Anderson would, at least at some stage of the process, produce a piston ring having a land projecting further than the coating surface. For example, the maskant would be applied to the ring, then the ring is coated, then the coating can be ground at the portion corresponding to the recess. The maskant will thus project past this surface as required by the product claim. The process limitations are also taught.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 571-272-7062. The examiner can normally be reached on M-F (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Will can be reached on 571-272-6998. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3676

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alison K. Pickard/
Primary Examiner, Art Unit 3676

AP